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GAME DESIGN | CODING | ART | SOUND | BUSINESS

CLIMAX STUDIOS

AR+VR+MR

SAMSUNG Gear VR

ARCore

PlayStation.VR

VIVE

htc | STEAMVR

oculus

Daydream

ARISE

Only on iPhone and iPad.

Lola and the Giant

Daydream

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GAME DESIGN | CODING | ART | SOUND | BUSINESS

EVOLUTION OF A GENRE

How much can a franchise like **Wolfenstein** change in a quarter of a century?

CLIMAX STUDIOS ■ VR AND AR ■ ALL-STAR FRUIT RACING

AT A GLANCE

OCTOBER 10TH

MIDDLE EARTH: SHADOW OF WAR

Fly you fools!

OCTOBER 13TH

THE EVIL WITHIN 2

Re-entering the warped mind of Tango Dreamworks on an apt date.

OCTOBER 18TH

GRAN TURISMO SPORT

Sony's flagship racing series finally makes its debut this generation.

OCTOBER 31ST

DAY OF THE DEAD

It's the first day of the Mexican holiday of rememberance, which runs until November 2nd.

DIARY DATES

esports WORKSHOP

ESPORTS WORKSHOP
November 2nd,
Congress Center, London
nbmevents.uk/futuregamessummit

OCTOBER

Game UX Summit 2017
October 4th, Ubisoft Toronto, Toronto, Ontario, Canada
epicgames.com/game-ux-summit

Indiecade 2017
October 6th, Little Tokyo, Los Angeles, California, USA
indiecade.com/2017/

Audiogame Jam 2
October 6th, Worldwide via internet submission process
audiogamejam.com

Warsaw Games Week
October 13th, Expo XXI, Warsaw, Poland
warsawgamesweek.pl

Play EXPO Manchester
October 14th, EventCity, Manchester, England
playexpomanchester.com

PAX Australia
October 27th, 1 Convention Centre, Melbourne, Victoria, Australia
aux.paxsite.com

EVENT SPOTLIGHT

FUTURE GAMES SUMMIT 2017

FUTURE GAMES SUMMIT
Where: Congress Center, London
When: October 31st - November 1st
What: Bringing together the best in gaming and technology to discuss the future of the industry
nbmevents.uk/futuregamessummit

COMING SOON

DEVELOP #188

NOVEMBER/DECEMBER 2017

Once again, Develop will spend the end of the year highlighting recruitment. As a new year starts, is it time for you to look around and find something new? Or do you need new talent? We'll have all the best advice here.

DEVELOP #189

FEBURARY 2018

It's a new year! Christmas is done, the season of January Sales is over and everyone should have caught up with their piles of shame. But, there's no rest in the world of game development and we'll be back with you too.

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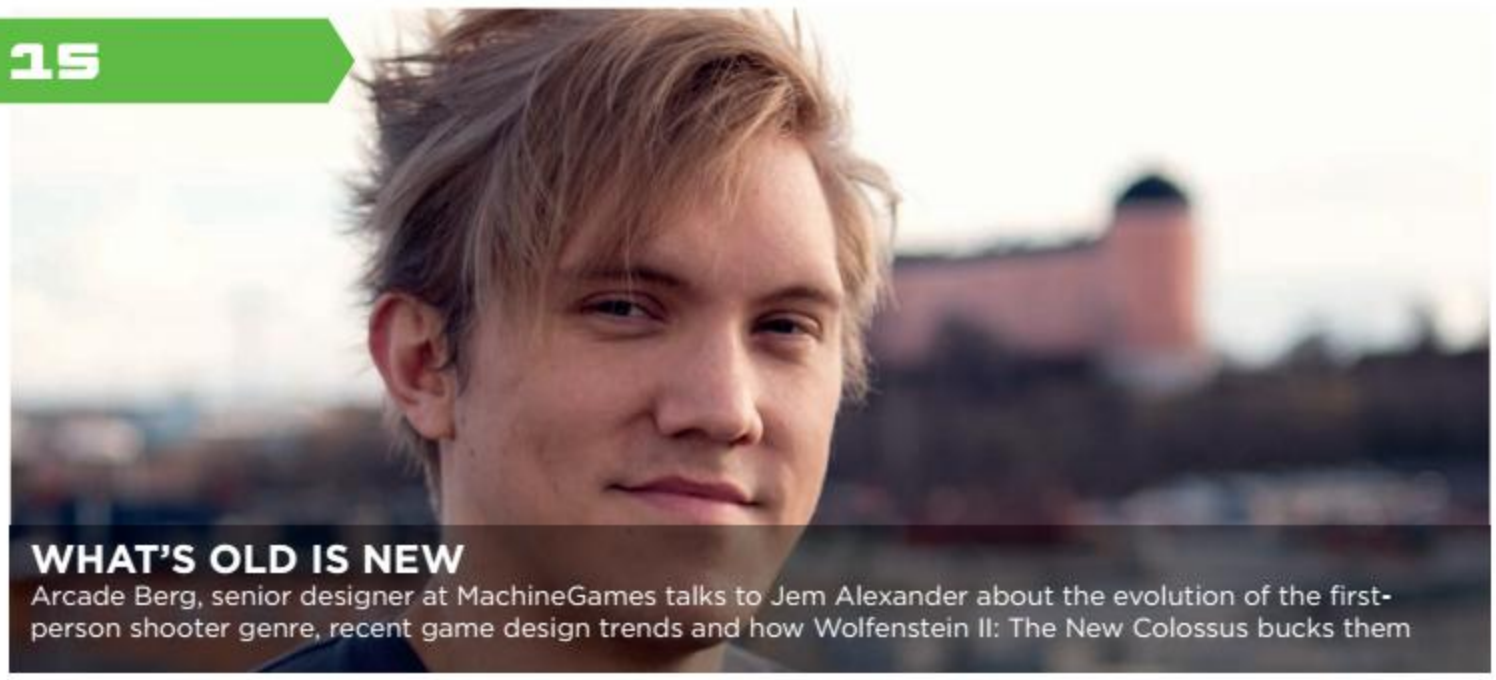

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Arcade Berg, senior designer at MachineGames talks to Jem Alexander about the evolution of the first-person shooter genre, recent game design trends and how Wolfenstein II: The New Colossus bucks them

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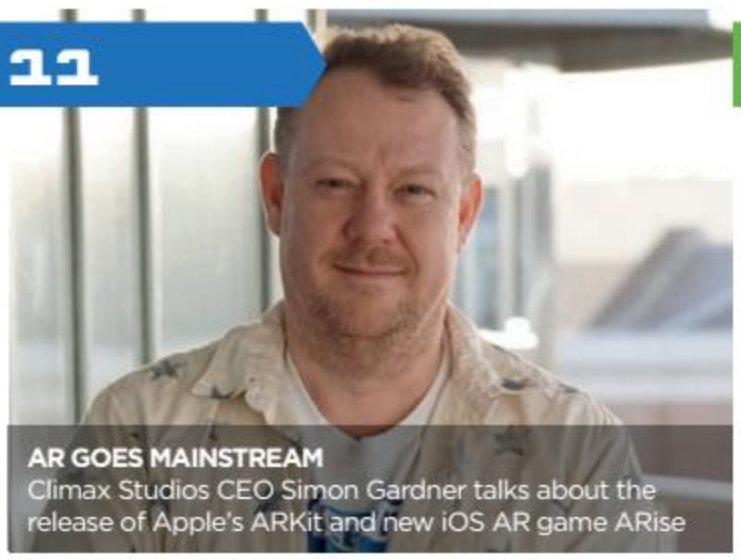

AR GOES MAINSTREAM
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How one Italian developer is attempting to revive kart racing

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VR ONE YEAR ON
Recruiters and developers discuss how the job market has changed

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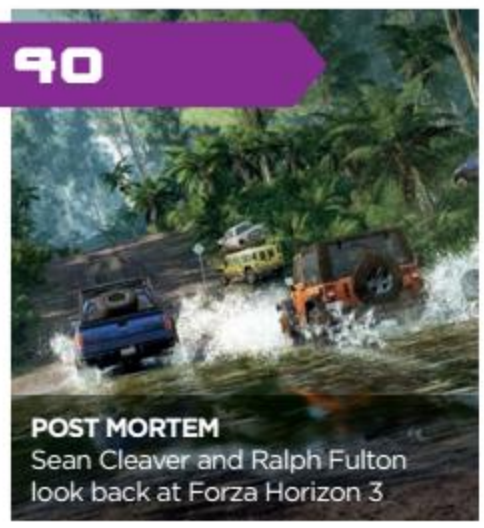

POST MORTEM
Sean Cleaver and Ralph Fulton look back at Forza Horizon 3

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Editorial

Mario's nipples were undoubtably the highlight of the last Nintendo Direct.

Who knew so many people around the industry had so many opinions about a fictional plumber's areolae.

Several members of the Develop and MCV teams have suspicions that this could be an intentional attempt by Nintendo to raise preorders numbers. Should sales start dropping off, we wouldn't be surprised to see him show a flash of buttcheek to help get people hyped again. And I have no doubt in my mind that it would work.

Your favourite franchises are moving with the times. It starts with a Mario nipple here, and continues with one of the industry's oldest FPS series using sex and drugs to push its anti-Nazi agenda.

I'm talking about Wolfenstein II: The New Colossus, on which our cover feature for the month is focused. We take a look at how the FPS genre is changing and what MachineGames is doing to push it even further.

> **We take a long hard look at the world of VR and AR – another area of the industry that continues to move with the times**

Meanwhile, elsewhere, we take a long hard look at the world of VR and AR – another area of the industry that continues to move with the times. Climax Studios and Supermassive Games both discuss what they're doing to explore these technologies.

There's plenty more to read this month too, but just to manage expectations: there's not a nipple to be found. Sorry.

Jem Alexander
jalexander@nbmedia.com

SHARED **DESTINY**

In online games narrative often comes secondary to gameplay, but **Jem Alexander** argues that it's Destiny 2's strength of story and world building that keeps its claws in him and encourages cooperative play

I tend to bounce off MMOs. A couple of weeks, usually, but some have managed to stick with me for as long as a few months. *Ultima Online*, *Final Fantasy XI* / *XIV* and *Neocron* are those that lasted the longest. Yeah, Neocron. Remember that? I developed a strong obsession with that game just before my GCSE exams began. Meaning I spent less time studying than I did daydreaming about cyberpunk sewer systems and min/max strategies.

But I always played it alone, and perhaps that's why I always bounce off. I play MMOs as if they are single player games, which just happen to be inhabited by other players who are doing exactly the same thing as me. I rarely engaged with other players, though 14-year-old me did once receive an in-game marriage proposal in *Final Fantasy XI*, so I guess technically I did once get engaged. But that's another story.

My point is that these games, which are social by design, never got me to play "properly". I never joined forces with those players performing the same quests as me; instead I would scowl at them as they murdered the ten cellar rats I needed to kill in order to save the old mill owner's business. *My cellar rats.*

And yet, here I am, utterly addicted to *Destiny 2*. Again. I can't explain what it is that this game does that those MMOs didn't, but there's something here that makes the game incredibly sticky for people like me, who are basically playing it as a single player game. It helps that this sequel has a strong, well performed narrative.

I'm amazed by the number of reviewers who seem to suggest that this is a first for the series. Clearly there are a large number of *Destiny* players who fell off of Vanilla and never came back. Which means there are a lot of people playing *Destiny 2* who never experienced *The Taken King* and who might never have properly met Cayde-6, Ikora and Zavala. People who still haven't met Eris Morn!

As someone who jumped into the series at *The Taken King*, seeing the step up in narrative from the Vanilla content was like Bungie flipped on a light switch. The Vanguard gave this story-chaser a reason to care about the world that the mute player characters, manically chasing their tails around me, could not offer.

Beyond the strength of story, *The Taken King* and *Destiny 2* did something remarkable; they convinced me to play with friends. Not the narrative sections – there's a reason the "real" *Destiny*, with its grindy pursuit of power, is best played with friends and begins after the main campaign ends. But this grounding of story before you are required to join a fireteam is so deep and strong that it grabs people like me, the single player gamer, and gives us all a shared history on which to build our multiplayer experiences. Perhaps other games have managed this, but this mixing of a story campaign and multiplayer, all in one shared world, not separated out as title menu items, feels unique.

> **The destruction of the tower is a symbolic cleansing of everything that came before**

The step up between T*he Taken King* to *Destiny 2* (the less said about *Rise of Iron*, the better) was even stronger. The destruction of the tower isn't just literal, it is a symbolic cleansing of everything that came before. All the story beats from *Destiny* Vanilla are 'fixed'. Even individual lines of dialogue are given second attempts, where appropriate ("I don't have time to explain...") and characters are killed off in an attempt to reframe the entire franchise. The tower is rebuilt – a *new* tower, constructed using the years of experience gained since the launch of *Destiny* in 2014. Experience gained by the human survivors of the Red Legion, but also by Bungie itself.

For both, mistakes were made in the past. Hubris was punished and learnt from. But a bright, hopeful future can be seen on the horizon as the game's campaign ends. The Traveller is awake and its false prophet is dead. With that, everything changes. Despite the familiar trappings of *Destiny 2*, this feels like something new, and no-one knows what's going to happen next. Whatever comes, let's experience it together. ■

VR ISN'T DEAD YET!

One year ago, **Sean Cleaver** spent upwards of £450 on Sony's newest technological toy. Critics and consumers may be a bit cold on the tech now but he still believes that there is much to celebrate

I am often asked about the state of virtual reality. It's not just at trade shows or visiting studios, I'm asked at weddings and family functions and I say the same thing every time – I love it but it's not fully ready yet.

That is my opinion and it's a slightly biased one as my only access to VR is the impressive yet underpowered PSVR. I don't have the fidelity or power of a PC based set up, yet this isn't a problem.

My partner loves VR. VR doesn't have any issues with controls that are hard to understand. You can sit there and enjoy the standing in a shark cage or sit in the Apollo 11 command module without having to touch a single button. We take for granted, as gamers and people that interact with gaming technology on a daily basis, how natural a dual analogue stick control is for us.

So in some ways, I'm a big supporter of the technology. It enables people that otherwise wouldn't play games to do so and it is a great way to experience something like a moon landing. But you have to point out the limitations in the tech that stop people playing.

To name a few: the human need to not look stupid while doing something is obviously negated by the big plastic headband strapped to you. The body does not like being tricked in to immersive movement or else it can make you nauseous. Technical limitations in tracking and connections can make it a technophile's party piece rather than an out of the box household go-to.

Sales figures certainly back up a relatively positive and surprising take up in the technology. So what we are really ending up with here is bit of an identity crisis. On the one hand, you have a great bit of technology that can put you in to a world like nothing else. On the other, an expensive plastic shell that you wear like goggles in front of a Bunsen burner.

It's fascinating then to see that the market leading VR headset is at times lacking the kind of games that make the medium what it is. The tracking mechanisms employed by the PlayStation Camera can hamper PSVR's shooting gallery games. But the PSVR does have some of the best examples of VR games. *Superhot VR* is possibly the shooting game at present and it is the cleverest by far, despite the PS Camera's FOV occasionally dampening the otherwise smooth experience. But that, along with games like *Arizona Sunshine* are great examples of how VR is great for wave attack and shooting games

On the other side of the coin, racing games are almost a marriage made in heaven for VR. You only need to look at what PC based VR has achieved in this field with *Project Cars* and *Assetto Corsa*. PSVR sadly has been left a bit in the dust on this one, although *Gran Turismo Sport*'s new 1v1 mode might bring it back to the fore. Is the system powerful enough to deliver the quality so desperately needed for driving games though?

> **For home gaming, VR is always going to be a bigger and better application**

I've been surprised by the lack of horror titles so far on the PSVR but again, we have some stand out examples. *Until Dawn: Rush of Blood* and *Resident Evil 7: Biohazard* are great games. It saddens me though that we haven't had a game that utilises the PSVR's in-built microphone for the horror genre.

Something incredibly creative going on with VR and that's very exciting. Games like *Lola and the Giant* by Climax Studios, *Keep Talking and Nobody Explodes* by Steel Crate Games and even triple-A games like *Batman: Arkham VR*, *Skyrim VR* and *Doom VR* all bring something new, and exciting to gaming, even if the games are older titles. It's both a reinvention and revolution.

AR is going to be big for mobile games and industrial applications, but for home gaming and experiences, VR is always going to be a bigger and better application.

We probably are a bit critical of the medium because yes, it is clunky, it's expensive and the cheapest VR entry kit isn't powerful enough to create what other headsets are capable of. We also are critical of publishing approaches too – Where is the marketing? Where is the PR?

A year will have passed since PSVR came out by the time you read this and, in that time, 248 titles will have been released or announced. That includes games, interactive movies, streaming cinemas and experiences. Sure the medium is young but it's a lot of fun and I'm sure it's here to stay. ■

REALITY CHECK

Rumours of VR's death have been greatly exaggerated, argues Climax Studios' CEO, **Simon Gardner.** While niche now, the technology only paves the way for the ubiquity of AR and a new iPhone could be the catalyst

Watching the Apple Event, I was surprised with how little time was spent on the AR capabilities of the new iPhone 8 and iPhone X. Having lived and breathed both VR and AR for the last four years it's easy to forget that most people are still largely in the dark. The excitement of VR swept through the games industry and wowed investors. It almost feels like ancient history now.

It felt to me that the shine of VR had worn off. Hardware costs were too high and a lack of killer games to drive adoption meant a small install base. The commercial viability of producing self-funded games was borderline at best. Climax's most successful titles have been made with a limited budget and sold at a modest retail price on mobile VR devices. With cross platform publishing we achieved sales in the hundreds of thousands of units. However, in recent months there has been a resurgence of interest in VR and I say this from a business opportunity point of view.

The price drops, the arrival of games with both better production values and understanding of how good VR works has led to a visible increase in adoption. I noticed this with the several Twitch streamers I follow and particularly, *Lone Echo* from Ready at Dawn seems to have caught the attention.

Business enquiries regarding VR have started to rise too. I was at Oculus' HQ a few weeks ago and there was a definite spring in the staff's step and a newfound confidence about its place in the market. It was good to see, given its role in the more recent story of consumer VR.

Some of our focus has moved to AR. We launched *Towers* on the Google Tango device and learned a lot. We did a fair bit of research on the HoloLens, which was very illuminating. We have a number of other AR titles in the works and recently broke cover with *ARise*, our launch title puzzle game for iPhone and iPad using ARKit.

The genius of the Apple approach to AR is that, as a software solution in iOS 11, the functionality is going to be pushed out to all of their supported hardware overnight. It sidesteps the whole issue of low install bases and user uptake. With close to 400 million potential devices day one, the economics of producing AR content suddenly make sense. And with Google hot on their heels with ARCore launching on Android next March, AR will be available to the masses. Over a billion AR devices – the opportunities are staggering.

But how AR is going to become involved in everyday life? Well at the risk of overselling it in the short term, I see it as all pervasive. It will touch nearly every aspect of a persons life and their activities. For me it is all about friction. If things are easy to use and have nearly zero friction then they will become ubiquitous.

At the moment if my phone makes a noise, I have to get it out of my pocket, unlock it and then tap an icon to read the message. Most of the time that message could wait or is totally irrelevant. I've short cut that by using a smart watch, glancing at it to read the first few lines of the message and decide if it warrants further effort. The watch also performs other functions like health monitoring and it even tells the time!

> **If things are easy to use and have nearly zero friction then they will become ubiquitous**

Now, imagine that technology with another personal item that many people already carry. I see a future where I have some AR glasses (that hopefully don't look ridiculous) and that header message will pop up in my vision and I can use a verbal command to either open it, store it for later, or kill it. Phone AR is a long way from that, but it is all part of the journey. It allows the technology to get smaller and lighter and more efficient in terms of power draw and heat generation.

The face recognition technology in iPhone X is also interesting as not only could it recognise me, but can start to recognise other people. This then leads to more reduction in friction. Information is being relayed to me constantly. Be that reminders of who I am talking to through to navigation, news and messages. I've downloaded many apps that I was interested enough to go through the process, but only used a few times. A good example of this would-be astronomy apps that show me the location of planets and constellations and the ISS. The effort to use outweighs the benefit. Reduce the friction and make it available on a voice command and I'd be re-engaged.

A further possibility of portable AR systems is a TV screen. You can place virtual screens in an environment through AR. The important thing here is to look beyond the novelty of it and see the real take away – you don't need a TV with AR. I heard rumours of an Apple TV screen a few years ago, which never materialised. What if Apple realised that AR was truly a disruptor technology? That progression from phone to glasses AR would be the end of all screens? ■

COMMON PR **MISCONCEPTIONS**

Indie developers looking for public relations representation have plenty of agencies to choose from. Renaissance PR's **Stefano Petrullo** has some sound advice for devs looking to interact with the media

Public Relations is a wild and dark discipline according to a lot of people. I'm not talking about unethical practices and conspiracy theories here, more about the perception of what me and my peers doing on a daily basis.

Since I opened my own little company I have been approached by a lot of people, potential clients and students curious to get their game covered by media, YouTubers, influencers. The usual misconception is that it's possible to get the game reviewed in the week of launch: while this is true and should be the aim of every good PR campaign, it's worth noting that to achieve those results every PR professional has to do a lot of preparation and planning.

The external result of a PR campaign is only a fraction of the curation and planning that takes place before launching the game, like lifting an embargo on a trailer or having those preview codes sent out.

While some people think (and this is our fault) that doing PR is 'sending the code out', the reality is very different. Let's have a look at a couple of things that help a lot with the alchemy of discoverability, coverage, buzz or, in simple words... letting people know you are there.

TIME

One of the most important factors is the time that you have to launch the game. Calling a PR professional the month of launch will definitely increase your visibility, however if you want to get the top 5 websites in the world talking about your game and you engage a PR professional the month of launch, you will end up paying a lot for a short last minute campaign. And likely not get anywhere near those top website. The reason for this is that a good communications professional is not a postman (without any offense to postmen, who do an amazing job). Delivering the code in time is one of our top priorities, but is far away from being the most important one.

> **Get some media training, which is a super posh word we use for 'common sense'. For example, do not bad mouth competitors. Or anyone**
> *Stefano Petrullo, Renaissance PR*

PLANNING

To achieve your objectives and have your game in the inbox of every single media outlet and influencer in the world, you have to have a communications plan. Today, the average campaign length varies from 2-3 months to 6-8 months (this is excluding delays, cancellation, bankruptcy etc). It's fair to say that most indie games can live with a good short, intense campaign versus a long one. But you have to contact an agency long before to actually start 3 months before launch.

CURATION

This is what is happening behind the scene, this is where all the conspiracy theories about the game industry and the relationship between PR and media/influencers have come from in the past. Curation is the key... Curation in understanding the project and curation in engaging media and influencers in a conversation, looking at what is trending at the moment (Pokemon GO and No Man's Sky anyone?) and seeing if there is a link to your product. After you have essentially laid out your plan and set up the production pipeline, it's time to go out and made your product unique and, nowadays guys, this is really hard!

We've reached a stage where a game needs to be not only of good quality, but also newsworthy in order to emerge from the crowd. A good PR professional will dig into your history, visit the studio and look for any details that can help to make your game stand out or be interesting.

BE AVAILABLE TO COMMENT

The media wants to tell interesting, non-scripted stories, they want to have people expressing their opinions on what's happening in the market or in the world. Stay updated and be available to comment and express your opinion. Before storming on Twitter... Stop. Think twice. Get some media training, which is a super posh word we use for 'common sense'. For example, do not bad mouth competitors. Or anyone. Expressing disagreement is okay, but expressing hate for something is a bit too much. To summarise, it's less about what you are saying and more about how you are saying it.

BE CAREFUL OF PEOPLE PROMISING THE EARTH

Agencies are good at selling their services and there are tons of good people doing PR for indies. Be wary of anyone that promises you too much, like newspaper coverage, top-tier website front pages or the biggest YouTubers. Try to get an idea of KPIs, a rough quantity of articles they plan to generate and do not be afraid to ask for clarifications. ■

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AR GOES MAINSTREAM

It's currently too early to tell what makes a successful AR game, but with the release of iOS 11 (and Google's upcoming ARCore) the stage is set for mainstream adoption of augmented reality games and apps. **Jem Alexander** speaks to Climax Studios CEO Simon Gardner about the rise of AR and the studio's new game ARise

Alongside the recent release of iOS 11 comes the ARKit framework, which looks to be a great step forward in making augmented reality games and applications truly mainstream. With the upcoming release of Google's ARCore for Android devices, this just increases the potential market for AR games even further.

Many developers still have faith in virtual reality and aren't giving up on the technology despite slow adoption, high hardware costs and a low speed of device iteration. Others have taken their experience with VR and adapted it for augmented reality which, some say, has a higher chance of hitting the mainstream and being truly successful.

Portsmouth based Climax Studios is still very much of the belief that VR is here to stay. The company's extensive research into virtual reality (the studio created Daydream exclusive title *Lola and the Giant*) is put to good use in its new AR game *ARise*, the first three levels of which launched alongside the release of iOS 11, with more content coming in the future.

ARise is a puzzle game that sees the player help a tiny hero navigate a hazardous environment which they summon into their real world space and can then view through the 'lens' of their iOS 11 device. Having the levels inhabit a familiar environment allows players to use the one tool at their disposal - perspective. By literally moving around the level and viewing it from different angles, the player can solve puzzles and pave the way for *ARise*'s hero's tale to progress.

"The project was the outcome of a studio game jam we had a little while ago," says Climax Studios CEO, Simon Gardner. "*ARise* is an experience about perspective. Using the AR capabilities of your device, you aim to align magical connections and create paths. No touch or swipe is needed, simply move around the floating islands, and look for the visual cues. Help the game's hero get to the top of the level and remove a magical artefact. This will reanimate the island into its original form."

This is a relatively simple use of augmented reality, but an effective one, and it is the first step on a journey towards something, Gardner suspects, that could be truly ubiquitous.

"We've barely started," says Gardner. "AR will lead to new playstyles, more multiplayer involvement and, as the hardware is able to learn more about its specific location, it will use real world items to build on the experience. The devices will continue to play around with time of day and possibly the number of other players in an area to build more interesting interactions."

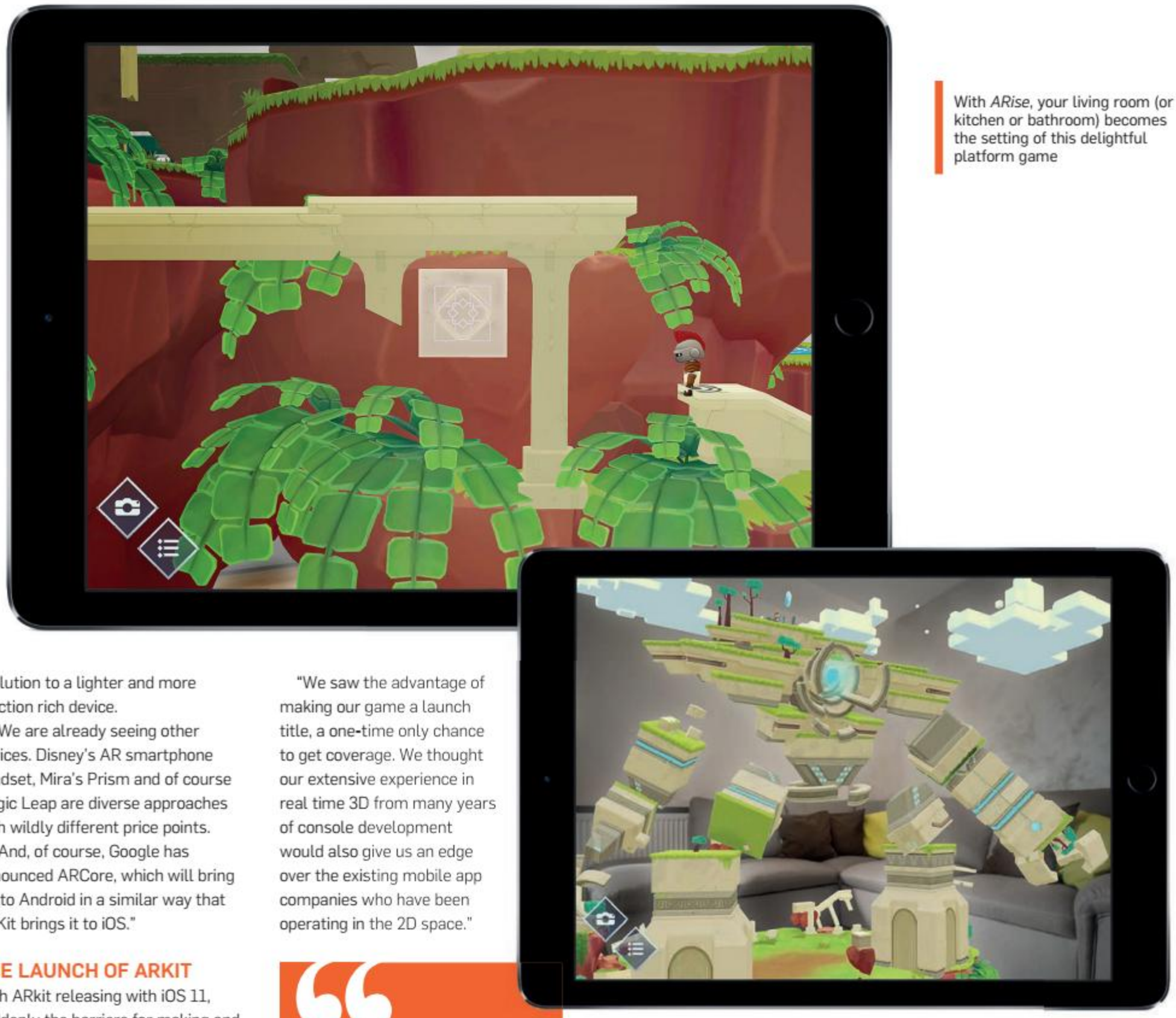
The idea of truly gamifying the real world could be seen as a *Black Mirror*-esque nightmare, but many developers see this as being the next logical step in games. With traditional games plateauing in terms of graphical or technical leaps, new paradigms could add some novelty that games have lost over the years. Overlaying gameplay elements onto the real world would be one such area prime for exploration.

> **AR will lead to new playstyles, more multiplayer involvement and it will use real world items to build on the experience**

"Ultimately," says Gardner, "if the hardware does become even easier to use and 'always on' (perhaps glasses?), then games could become integrated into daily activities but at a fairly low interactive level unless the player chooses to fully engage.

"I hope and expect AR on mobile devices to be a stepping stone to an even more 'frictionless' device such as glasses. Using a mobile phone allows developers and users to get used to the idea of AR with an existing device at low additional cost. It also allows for new play experiences that will hopefully keep the public engaged in gaming, but obviously it is also extremely useful for other applications.

"Hololens is very important in its role to show quite how far we were from a light, compact glasses future. Microsoft has done an amazing job in packing all of the technology into a small space, with battery life and heat dissipation issues mostly solved. But the limitations of viewing field really hit its gaming use. I didn't really see any compelling games on it and its user interface, while functional, was again severely limiting for games. This was clear as it was only really marketed as a business tool. I assume Hololens v2 or v3 will continue the



With *ARise*, your living room (or kitchen or bathroom) becomes the setting of this delightful platform game

evolution to a lighter and more function rich device.

"We are already seeing other devices. Disney's AR smartphone headset, Mira's Prism and of course Magic Leap are diverse approaches with wildly different price points.

"And, of course, Google has announced ARCore, which will bring AR to Android in a similar way that ARKit brings it to iOS."

THE LAUNCH OF ARKIT

With ARkit releasing with iOS 11, suddenly the barriers for making and marketing augmented reality games are crumbling around developers' ears. It gives devs the confidence to experiment in this new area of game production, knowing that their games will be supported by a large number of devices that people already own.

"My biggest single thought about ARKit was that when they launch it, there will be a potential install base of just under 400 million devices and rising," says Gardner. "That's a game changer. ARKit came almost from nowhere and we had to work quickly to support it. Given our previous experience on several AR games, we were able to move fast and make a compelling experience that will only grow over time as we add more content.

"We saw the advantage of making our game a launch title, a one-time only chance to get coverage. We thought our extensive experience in real time 3D from many years of console development would also give us an edge over the existing mobile app companies who have been operating in the 2D space."

> **My biggest single thought about ARKit was that when they launch it, there will be a potential install base of just under 400 million devices and rising**

The large install base of Apple's devices mitigate the risks that are still inherent in VR development. High costs and low sales mean that VR won't be viable for a certain level of games studio until hardware improve and drag up the quality of the overall VR experience. Having to wear bulky headsets and regularly calibrate settings make it a much less compelling activity when decompressing at the end of the day than simply playing a traditional game on a 2D screen.

"The biggest issue with VR is cost and install base," says Gardner. "This limits its potential profitability and also the high-end nature of the hardware sets an expectation of the experience. This drives up development budgets, but low install bases hit profitability. The other lesson we can learn from VR will be utilising the strengths of AR and building experiences around those.

"My advice to other developers would be to make sure your game is augmented reality, and not just a traditional game played out on a plane in AR. Make use of the player's ability to lean into and move around the scene. Make full use of the capabilities of the device so that you can minimise additional controls.

"Some traditional mechanics will fit into AR games, some won't. The overall ideas of games such as collecting, storytelling, fighting and puzzle solving will broadly fit, but how you do those activities and for how long will be the issues.

"There will also be the question of *where* you do those things. By bringing location and real world items into the mix it should feel different. As we have done with *ARise*, you can also use new methods of interaction into play and maybe open up games to a new audience." ■

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WHAT'S OLD IS NEW

Wolfenstein II: The New Colossus is the latest in a twenty five year old franchise which has watched countless other FPS IPs rise and fall over the years. **Jem Alexander** talks to Arcade Berg, senior game designer at MachineGames to find out how shooter design has is evolving

The history of the first-person shooter begins with *Wolfenstein 3D*, so the release of *Wolfenstein II: The New Colossus* twenty five years later feels like a great opportunity to check in on the state of the genre. In a quarter of a century shooters have evolved tremendously. When it comes to *Wolfenstein*, however, one thing stays constant; you're going to be shooting a lot of Nazis in their stupid idiot faces.

MachineGames wowed critics in 2014 with *Wolfenstein: The New Order*, which refreshed the series by framing the Nazi bloodletting around interesting and relatable characters in an alternative history setting. The introduction of a strong narrative around one of history's most basic ethical no-brainers (hurting Nazis is cool) transformed the series from just another shooting gallery into a compelling adventure. But it's the mechanical additions to the *The New Order* and *The New Colossus* which truly demonstrate how far first-person shooters have come.

"One thing that you're seeing (which I'm a big fan of) over the last five years or so is that we've been starting to focus a lot more on player movement than before," says Arcade Berg, senior designer at MachineGames.

"Previously to that it was a lot about the shooting and aiming, especially with sticks and gamepads. Mouse and keyboard we nailed pretty quickly. Then we started with the gamepads and we had to figure that out. Now we have so many systems for aiming with sticks that we mostly agree on what works and what doesn't."

Dual-stick movement on a gamepad is well established. One stick to move, one to look. This allows for all-important strafing and bunnyhopping and twelve year olds schooling aging games journalists in titles they're not even old enough to be playing. But there are also a lot of little tricks that FPS devs use to give those of us with deteriorating reflexes a helping hand.

"We have a bit of magnetism to the aim," says Berg. "If you pull the stick

across an enemy, it will actually slow down. We have a bunch of systems like that under the hood in almost all shooters. That's why it's fairly easy to play with sticks, because there are so many underlying systems helping you out. Some games help you a lot, some games very little, but all games help you in some way.

"Usually games that involve more movement, like jumping and running around, they help you more because you're always in motion. The slower ones tend to help you less because you're already stationary, so you have more time to aim. I think we, as an industry, moved on and now we're working a lot on player movement. You see double jumping and wall running and parkourish stuff and jet packs and all these new things that aren't walking, running and crouching.

"Most shooters have something, and it's not a competition about having the most or having the coolest, but even in more traditional shooters you will notice that they have a lot of helpers.

"*The New Colossus* is a fairly grounded game, but we also have a bunch of stuff helping you. You can mantle over things – we allow you to do that with several different buttons so you can pick the one you feel comfortable with. We'll align you to the obstacle during the animation so you get over the side in the right place. Sometimes we can't put you straight over because you'd be inside the cover, so we go *yoink* and put you where you should be. There are all these tiny things that help you. In cover shooters you see a lot of games that allow you to press a button and slide into cover, so there's a lot of stuff like that happening. And that's where I think a lot of people are still experimenting."

AGAIN, BUT BETTER

The design philosophy behind *Wolfenstein II: The New Colossus* is basically to take everything that made the first game such a critical darling, and to do it better.

"We took what we had and we went even further with it," says Berg. "With the first game we had to figure out 'What is *Wolfenstein* to us? What is *Wolfenstein* to the players? What can we do?'. We were building a studio, building a game and figuring out *Wolfenstein* all at the same time. People liked it and it sold well, so that was our affirmation of 'yes, we got this' and that was validation and confirmation that people want more.

"So we're not messing with what worked, but we're taking it further. For example we have the dual wielding. In *The New Colossus* we allow free dual wielding with different weapons. People loved wielding two automatic shotguns, but we thought it would be cool if you could have one shotgun and one scoped rifle or a silenced weapon."

Silenced weapons were key to another aspect of *The New Order* that players enjoyed. Namely, killing Nazis without being seen.

"People really liked that we had stealth in *Wolfenstein*," says Berg. "Stealth for us isn't just avoiding combat, it's about killing unnoticed. You're always going to kill the enemy. So we've given you more tools to stealth with. Instead of just a silenced handgun, you can also have a silenced machine gun. We've given you more of what we call 'verbs'. Things you can do as a player to be stealthy. We have these contraptions, one which allows you to shrink down into really tight spaces and crawl through pipes where normal people don't fit, for example. We've tried to take everything and go even further with it."

A lot of what *Wolfenstein* is doing nowadays is counter to what we're seeing across the broader first-person shooter landscape. *Halo* introduced

the 'two-gun, regenerating health' model that saw the end of protagonists wielding nine or ten weapons of increasing size and weight all at once. The industry took hold and, like a dog with a sticky grenade, was unable to let go. *Wolfenstein* nods, waves and blows a kiss to its old-school legacy by ignoring that and letting protagonist BJ rock as many heavy armaments as he fancies. The game's younger sibling, *Doom* did likewise in its 2016 reboot.

"Some games work really well with two guns and regenerative health," says Berg. "It really depends what kind of pacing and flow you want to roll into combat. We have regenerating health, but only to certain 'blocks'. Let's say 100 is your default health, if you drop down to 18, you'll regen to 20, not 100. This is because we want to give you some assist so that you don't go down to two health and just expect death. In our game we want you to feel like you screwed up if you screw up, and you're going to have to own it.

"You're going to have to find health packs in the environment, because a big thing in *Wolfenstein* is exploration. Finding the loot. If you had regenerating health why would you bother? In our game it's worth a lot to visit those extra rooms and check that alternative route, because you might find armour, which is a really important thing. Armour doesn't regenerate at all.

"So it depends what you want. If you want a game that always moves forward, even if you mess up a bit, that's more of a smooth ride – which is perfectly fine, and there are amazing games that do this – then maybe cooldown or regenerating health is the way to go."

RAT-A-TAT-TATTLE TALE

In the years since the original *Wolfenstein* games have explored many new frontiers. Higher resolutions, 3D graphics, realistic lighting and textures. Bigger, more bombastic foley and sweeping orchestral musical compositions. Plus the introduction of *actual story and characters*. Is the industry's ability to incorporate better narratives becoming a more important part of game development?

"I don't think it's more important, actually," says Berg. "I think we're just starting to do it differently. People are starting to appreciate it. But I think it's always been equally useful. You have games today which are perhaps a bit thinner on the narrative side that are still super popular and people love them, and you have really old games that people still talk about because they had amazing narratives. I don't think that's changed.

"With better technology, with the cutscenes and the models and so on, we can provide more expositional narrative in the games now. When we had 320x240 pixels on screen we didn't have the capabilities to even do it. But back in the old days we still had MUDs and roleplaying, so I think now it's just that we have the tools to actually do it."

> **Stealth for us isn't just avoiding combat, it's about killing unnoticed. You're always going to kill the enemy**
> *Arcade Berg, MachineGames*

The storytelling in *The New Order* was one of the game's highlights, and from what we've seen the same will be true of *The New Colossus*. Larger than life characters, amusing dialogue and expertly directed cutscenes litter the game, but that's not where the studio has been making the biggest strides when it comes to improving narrative design.

"We got a lot of praise for the narrative in *The New Order* and we got a lot of praise for the shooting," Berg explains. "We were also told that we had a good balance between the two, but there's still this area where they meet and that's where we've been working a lot. The shooting works. The cutscenes work. It's the parts in between that we need to work harder on. If there's a cutscene, it's a cutscene. Sit down, relax and enjoy the show. If there's a gunfight, play the game, do your thing, have fun. But when they meet, which is narrative events in the game while you're playing – whether that's meeting characters or even simple stuff like pulling switches – we have a design philosophy that we will never take away player control.

"You will never control BJ and then your input doesn't work anymore because he is now 'in story'. While the game is running you are always in control of him. When people are talking you are free to move around. It sounds simple but it does so much. Even things like pulling a lever, if you're still moving the movement stick, you will see him move. Simple things like that. Bridging the gap between the two. There's definitely more room to explore, but we're in a much better place."

Wolfenstein II: The New Colossus is releasing at a time where we are bizarrely (and scarily) seeing a re-emergence of Nazism in certain areas of the world. Even though the game features plenty of political and social commentary of World War II, the scope and pre-planning of the project doesn't allow for any contemporary commentary. Other than 'Nazis equal bad', of course. Then again, what more do you really need?

"Events in the US have not affected development of the game at all," says Berg. "We've been working on this for many years. When we made the first game we were hoping for a trilogy, so the seeds were already planted. Even if we wanted to we couldn't change the course of the project, because it's such a huge moving ship. In ten years the game is still going to be around and it needs to be its own thing standing on its own legs, and hopefully people will still be talking about it.

"There's absolutely an interpretation and commentary on past history and humans. It's people. We're blending ethnicities and that kind of thing on purpose. Nothing in the game is by accident. But we're not trying to make a daily commentary or trying to change what's happening now."

But is even that necessary? Do developers have a responsibility to educate players, as well as entertain?

"I don't think we have responsibility, but I think that we should encourage developers to do so," Berg says. "If you have the power to do it, do it. Let's enlighten society, right?" ■

FAST FRUIT

Jem Alexander speaks to Francesco Bruschi, founder of Milan-based studio 3DClouds, about the developer's attempt to reinvigorate the kart racing genre and the state of the Italian games industry

Quick, name a recent kart racer off the top of your head. Did you think of *Mario Kart*? No, I'm not a magic psychic man, I'm just painfully aware of the fact that there are so few kart racers around nowadays. The 90s are long over and the days of *Crash Team Racing*, *Diddy Kong Racing* and (the undisputed best of the list, don't @ me) *Chocobo Racing* are long gone. But that hasn't stopped Italian developer 3DClouds from trying to revive the genre, one fruit at a time.

Based in Milan, 3DClouds started life as an outsourcing company, but has now moved into developing its own games. The first of these is *All-Star Fruit Racing*, the company's own twist on the kart genre.

"3DClouds originated as a multimedia service company providing IT and regional FAD, or distance learning, services, but due to my video games background we soon also began to provide 2D & 3D modelling," says founder Francesco Bruschi.

"I'd been outsourcing to Italian motorsports developer Milestone, where I had previously worked, but I soon decided I wanted to create my own indie studio and we began work on a demo version of our first title *All-Star Fruit Racing*."

While triple-A titles often go through layers of ideation processes, indie developers have the ability to be much more agile and spontaneous. A lot of indie games are born out of internal game jams, and some are even inspired more by the stomach than they are by the brain.

"It was born during a conversation at the coffee machine where we were moaning about the dearth of kart racing games outside of Nintendo consoles," says Bruschi. "Many of us could not afford to buy yet another console just to play one game. We ended up chatting by a vending machine about why there are no karting games for current generation systems outside of Switch and how nothing major has hit Steam for a while. It was then I decided I wanted to make one. Problem was, we didn't have a brand like *Mario* or *Sonic* to build it around – we needed something everybody knows about to hang it on. Inside this vending machine was a carton of fruit juice, and so that was it, that was what we needed – we went with fruit!"

GROWN IN ITALY

Milestone is the largest, most famous development house in Italy and many employees have left to found their own studios. 3DClouds is one of these.

"Working at Milestone was a great experience," says Bruschi. "The studio

is almost like a video games university for developers starting out in Italy. I learned everything at Milestone; teamwork, procedures and the importance of precision.

"What you learn at a company the size of Milestone you can't learn anywhere else – at least in Italy – and it's no coincidence that almost every indie developer in Italy is composed of ex-Milestonians."

Since its founding, 3DClouds has seen an influx of development talent which has allowed it to create *All-Star Fruit Racing*. Bruschi has visions of Italy's studios continuing to expand and pave the way for a bright future for Italian games development.

"We started out with our team of rookies," Bruschi explains. "However, during 2016, several video game veterans bought into our project and joined our team. Tired of the constraints of larger studios, they jumped at the chance of creative freedom and have brought with them decades of experience that has given a massive boost to the team and the project. We now have a solid backbone of veterans in every critical area.

"Italy is well behind most other countries and is playing catch up. It's only this year that the government has shown interest in the industry and new tax breaks should be available soon. Italy is the highest taxed country in the Europe with also the highest employee costs, so starting any business is not simple and most don't see out their first year.

"Regarding the developer community, this is really just starting to bloom now. As mentioned before, most of the indie studies come from Milestone, which means most of us have worked together at some point or have people in our their team who have. My dream is for several of our indie studios to grow significantly so a real industry can be born in Italy."

KART CRAFT

Making a game in an underserved genre is a risky move, especially for a first project. And especially when the genre leaders are so established, but 3DClouds believes there's a market out there which will love *All-Star Fruit Racers* and are interested in seeing a new spin on the old karting formula.

"The choice of a kart racer as a studio's first title puts you up against the *Marios* and *Sonics* of this world," says Bruschi. "That's something we didn't really give enough weight to at the time. Don't get me wrong, we love those games and would never pretend to compete against them, but the nature of the genre means the comparisons are automatic.

> **My dream is for several of our indie studios to grow significantly so a real industry can be born in Italy**
> *Francesco Bruschi, 3DClouds*

"Kart games are very difficult to create because not only do you have the classic arcade race with all the weapons and power ups to deal with, but you also have to create a smooth and credible racing experience within that. It's a big challenge. We've added a twist to the typical power up system with the Juicer, which offers a totally different approach by adding an element of strategy to the race.

"All genres become labels, and as soon as you say your game is this genre or that genre, you immediately put yourself up against the biggest games in that area. As an indie, it's like signing up to go 12 rounds with Mike Tyson as your first fight.

"What makes ours different, however, is that most of the big kart racers in history have been spin-offs from other IP, which means the idea of a kart racer as a standalone series isn't really set in peoples' heads. A lot of people just see new, standalone kart racers as being the same. That's something we'll need to overcome."

With so many Italian developers having cut their teeth at Milestone, there's a strong legacy of racing games being made in the region. The games Milestone is known for tend to be closer to simulators than kart racers, so how difficult is it to make that transition?

"Simulation racing games need everything to be perfect," says Bruschi. "It needs to be as realistic as possible. With a kart racer, we could really let our creativity flow. The driving might feel less exact, but because you have no point of reference you have to create everything from scratch.

"It's a big challenge – you're not re-skinning last year's title but creating something fresh, and that's the challenge I would choose to take on every time."

The studio continues to seek out these sorts of challenges as it works on its next projects. One of which may be speeding away from tyres and tracks entirely.

"We have three titles on the starting grid," Bruschi says. "One in pole position that we are already working on and another two that we will begin soon. One is a racing game, and the other is something different..." ■

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GAMES GUIDE

Jem Alexander speaks to Mike Futter, author of The GameDev Business Handbook, to discuss common development pitfalls and how his book can help devs turn their great game into a successful one

It's fair to say that the majority of developers have a solid knowledge of making games. It's what you do. But when it comes to marketing those games, or starting and running a successful business, that's less instinctive. Which is where *The GameDev Business Handbook* comes in. Written by Mike Futter and published by Bithell Games, the handbook is an attempt to arm developers (and wannabe developers) with the skills they need to sell their great games.

"*The GameDev Business Handbook* is designed as a faithful companion for students and developers just starting out," says Futter. "Academic programs don't often dive deep into the business of running a studio, and this material isn't often sexy enough for conference presentations. Our hope is readers will keep a copy on their desk, bookshelf, or digital device as a reference throughout their careers."

But this book isn't just intended for newcomers or students. There's plenty of useful information within for established developers at large studios, too.

"We're still seeing so many developers break out of big studios and go into business for themselves," says Futter. "Even if someone has been working for an established company for years, they may have been insulated from all the moving parts. Especially the administrative engine that hums underneath the surface. Additionally, the guidance from experienced professionals, success stories, and cautionary tales offer insight and reflection.

"In the book's foreword, Mike Bithell describes *The GameDev Business Handbook* as 'the book I wish I'd had on my shelf when I started my first job in games 10 years ago.' We looked around for texts on this subject, and the ones we found overlap some of our intent, but don't completely mirror it.

"Additionally, the books we found that do touch on some of the same subjects are old enough to have been published before Steam, mobile gaming, and digital distribution.

> **Our sincere hope is that this book makes it to students and developers striking out on their own for the first time**

"Our sincere hope is that this book makes it to students and developers striking out on their own for the first time. *The GameDev Business Handbook* will build a foundation for readers in the areas of budget and finance, employment considerations, intellectual property, crowdfunding, early access, and more. We can't answer every question, of course, but we're giving readers key information to formulate inquiry about core business functions, legal protection, and getting a game to market."

AVOID COMMON PITFALLS

Many development issues are unique to the specific game you're working on, or on your team size and situation, but there are also a large number that are relatable by all developers. Futter uses anecdotes from a variety of devs from across the industry to illustrate.

"Developers often risk their personal finances when building their own studios," Futter says. "There are so many places to make mistakes, and it's easy to lose sight of all the fiddly bits.

"In fact, one of the decisions that developers often need to make early is about compensation. If your studio isn't making money yet, and you have a small team of people that quit their jobs, how are you going to tackle compensation? If you aren't going to take a salary, do you have a plan in place for paying yourselves back when your first game starts earning revenue? We share some thoughts from developers like Ninja Theory's Nina Kristensen on how to handle this.

"We also see a number of new studio owners tackle too much themselves. It's easy to say, 'it's not hard' and take on dozens of small, relatively easy tasks. That time expenditure has opportunity cost, though. It's a concept that many new business owners don't consider.

"*The GameDev Business Handbook* is filled with that sort of guidance. We want readers to come away saying 'I didn't even think of that!'

"One of our favourite pieces of the book is the epilogue. At the conclusion of each conversation, I asked each interviewee to share their most poignant piece of advice for up-and-coming developers. The responses touch on an enormous variety of topics, with equally diverse perspectives. We're beyond grateful for the time and wisdom shared with us during the writing of *The GameDev Business Handbook*. We can't wait to get it into readers' hands in October." ■

BETTING ON VR

Supermassive Games believes that there's plenty left to explore in virtual reality game design. **Jem Alexander** chats to executive producer Simon Harris about the studio's VR projects

Virtual reality is here to stay. So says Supermassive Games which, sure, has a vested interest in this statement being true, thanks to its extensive investment into creating games for the technology. But this also gives it a unique insight into the market, thanks to having several popular VR titles already on sale, along with two new projects (that we know of) coming soon.

"VR is incredibly important to Supermassive," says Simon Harris, executive producer at the company. "We've been lucky enough to have been involved in building VR content for four years now, starting with early demos for PlayStation VR, and by the end of the year we will have launched four games for PSVR – the most for an independent studio. Sony remains an important partner for us, but our VR ambitions stretch across multiple platforms. We're proud to have been able to build year on year with our VR experiences and will continue to push into different genres as we are with *The Inpatient* and *Bravo Team*."

There's doom and gloom surrounding VR emanating from some corners of the industry, but Harris feels this is premature. The key to making it a successful platform? Keep creating good content. Without that, there's no reason for players or manufacturers to invest.

"There is a great deal of discussion and hype about the size and value of the VR business," Harris says, "but the bottom line is that we have to focus on delivering the best possible experiences on the platforms we are working on. Only great content is going to encourage people to buy headsets.

"From our perspective, VR is delivering on what we hoped, which is an incredible new way to experience games. We think that we are only starting with what we can do in VR, so we have really high expectations on what we can deliver."

NO WRONG ANSWERS

By continuing to push what's possible within VR games, developers can make the technology more compelling for more people. It sounds obvious, but there are so many best practices within the 'traditional' industry today that it's easy to forget there was once a wild west of game development. That's where virtual reality development is today.

"I'm a little reticent when using terms like 'best practice' when it comes to VR game design," Harris says. "Regardless of whether you are developing for VR or TV based, you need to put yourself in the player's shoes, test a lot and listen to people when they tell you things after playing your game. That's the way you can truly improve your game.

"Last year when we launched our first games, I talked a lot about how we took some of the very early 'rule sets' that people were promoting as to what you could and couldn't do in VR and deliberately went about debunking some of them through our games. We specifically looked to go against some of the initial sets of 'do's and don'ts' that were being touted around in early VR development and the feedback we've had on our initial titles suggest that we did manage to prove a load of them wrong.

"As with any new platform, you have to design specifically to take advantage of that platform's strengths and minimise its weaknesses. This will mean that genres are adapted from their traditional form, but as long as the game experience is great, then players will embrace the changes."

With the studio's upcoming titles, *The Inpatient* and *Bravo Team*, Supermassive is pushing two very specific areas of virtual reality. With *The Inpatient*, emphasis is on immersion. Something that VR is uniquely positioned to deliver.

"We have two key parts here," Harris explains. "The first is that you are fully realised in the game world. At the start of the game you answer some key questions so that when you start the game you can look down and you see your own body, arms and legs. As you move around the environment we use the Move controllers (also works with DS4) to track your hands so you can see your hands and arms move as you do. You can interact with the environment, pick things up, pass things between your hands – even throw and catch stuff – all to make it feel as real as possible in the VR world. On top of this, when you are engaged in a conversation with the characters in the game we use voice recognition to allow you to add your voice to the experience. We've worked with Sony's technical team to deliver the true experience of you voicing the character you are playing as you say the responses and listen to the conversations. All of this combines to create a world which you feel amazingly immersed in."

> **From our perspective, VR is delivering on what we hoped, which is an incredible new way to experience games**

With *Bravo Team* Supermassive is focusing on trying to fix problems inherent in VR action games.

"*Bravo Team* is a co-op, cover based, first-person VR shooter," says Harris. "We built it from the ground up to support co-op play, so you can either play online, or offline with an AI partner. The features that make it stand out are our unique movement system and the level of immersion in the VR world.

"Our movement system does something I haven't yet seen in VR,

which is camera cuts. When making traditional TV based games, we use camera cuts a lot, just like film and TV, to set tone and emotion or to communicate to the player. VR has yet to really establish rules for cameras other than the player's head being the camera and most experiences locking to either first or third-person views. We are mixing this up, and because the game is cover based it delivers an experience that is incredibly comfortable for our players and allows us to do cool stuff with our characters and scenarios which would not be possible with a straightforward first-person only camera.

"What happens is that you are playing primarily in first-person. You see your body and your gun, you can aim down the sights or fire from the hip and look around like in the majority of VR shooters. When you want to move to a new cover point, we cut the camera to a third-person view of your soldier, you watch yourself move to the new point (potentially taking fire on the way) and then when you get there, we jump back into first-person again. We do this using a series of rules which we've developed to ensure that the player is not disorientated or confused about what is happening. This system then allows us to expand on the basic movement motions, with actions such as jumping over gaps, taking out enemies with your knife, reviving your co-op partner or even blowing out doors with charges on the interior section."

CO-OP VS COMPETITIVE

Multiplayer VR is something that is believed to be a big part of pushing the technology into new hands and markets. This is particularly true of social play, including co-operative experiences, of which we've not seen a huge number on VR. Yet.

"Multiplayer experiences are going to be a great thing in VR," says Harris. "With regards to co-op/social vs. competitive I think that they both drive different adoption markets. Competitive appeals to a lot of the existing player base on platforms such as PC and PlayStation, so it is a great way of bringing them into VR. Co-op and social appeals to a different market and maybe has more of a chance of engaging people who aren't already PS4 or PC game owners. If we can get all of them to try and have a great VR experience, that's only good for everyone."

> **With regards to co-op/social vs. competitive I think that they both drive different adoption markets**

The best advice that Harris has for developers looking to invest in virtual reality is to be proactive and forward looking. The technology is still evolving at a decent pace and that will bring new ways to interact and new gameplay possibilities. Be ready.

"There is a lot of focus on what's coming next and what improvements there could be in the hardware," he says. "There are some extremely interesting developments around tracking additional aspects, such as legs and eye tracking, which we make sure we are aware of and understand how they can improve our games. As these developments are included in future headsets we will be ready to make use of them.

"We're very proud of the titles we have already released on PSVR – *Until Dawn: Rush of Blood* and *TumbleVR*. We are extremely excited to get *The Inpatient* and *Bravo Team* out into the market. We think that we are only just starting with VR, we are experimenting and learning every day and continuing to take strides to deliver better games, so we are still very heavily invested in the platform as a whole." ■

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MERGING REALITIES

Merge VR is betting on the collision of the physical and digital worlds hitting the mainstream. The Merge Cube, a toy which puts holograms in your hand, is the first of its kind and founder Franklin Lyons hopes game developers will create world-changing content for it. **Jem Alexander** investigates

The strength of virtual reality is its ability to transport you to somewhere else. It is the ultimate escapism. But some argue that not everyone wants to escape the doldrums of their life, and actually the larger market lies in augmented reality. That's what Merge VR is betting on. The company has produced the first 'handheld holographic toy', the Merge Cube, which works with mobile devices and VR headsets to place new worlds in the palm of your hand.

"We started working on the Merge Cube back in 2014," says Merge VR founder Franklin Lyons. "It was part of the original vision of the Merge product. The concept developed to be handheld – this is where the potential of the product became realised. This idea that one simple cube could literally become anything you could imagine, in the palm of your hand. We took natural human interaction and made it digital. That's a fundamentally new human experience."

A fundamentally new human experience is quite a lofty goal, but the potential is there with the Merge Cube. Especially since the company is viewing the toy as a new platform on which developers can create new experiences. So, in effect, those new human experiences are in *your* hands.

"The Merge Cube is open to all developers," says Lyons. "There are hundreds of developers already working (and playing) with it now. We also have our $1M AR/VR Developer Fund which helps developers bring their creative visions to fruition. I come from the indie world so I want to make sure we can support that community of geniuses."

> **The Merge Cube is open to all developers**
> *Franklin Lyons, Merge VR*

Lyons believes that the concept of 'play' has been left behind in modern game development, but that this can all change with AR and VR.

"The pendulum is about to swing the other way," Lyons says. "Traditional play has been sort of abandoned in favor of pure digital experiences like apps or video games. It's ironic, but this advancement in AR/VR technology gets us back to the physical world. The key is to take what is inherently fun about the physical activity, and use the digital layer to enhance it – never distract from traditional play.

"Tangibility is key. Our brains are hardwired for this. With Merge Cube, we are using a basic form factor to connect things on a human level. If you do it right, it's incredibly powerful. We've worked really hard to nail the technology and the form factor so that it's simple and just works. Designing and manufacturing an object that could do this well was a challenge."

There are greater opportunities here than just gaming, too. The Merge Cube, while undeniably a 'toy', has a lot of educational potential both at home and in the classroom. Giving people something tangible to hold improves learning. Examples used were anatomical diagrams – holding an annotated human heart or skull in your hand, and being able to look at it from different angles, will always be more compelling than a two-dimensional picture in a textbook.

"I named the company Merge because of the grand vision of merging the physical and the digital," says Lyons. "It makes me giddy to think about how the technology is going to unfold in phases. Each one offering more and more capabilities and integration. From a development standpoint, it's the biggest creative opportunity of our time. AR will be like one of the four elements; it will exist everywhere. So pick a market you are into, build something for it, and you'll be alright.

"VR and AR is not for everyone... yet. But give it time, and it will make the human experience all the more wonderful." ■

FUTURE GAMES SUMMIT 2017

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WHAT'S ON AT FGS 2017?

The Future Games Summit returns to London this month and it's bigger than ever. Not only do we have the largest ever line-up of speakers from the games and technology industries, but the first ever Develop Live Game Jam will also be taking place. There's also a full afternoon of esports with the 'esports Workshop' taking place on Thursday November 2nd.

Our panels will tackle everything from VR to AR, discoverability and talent retention. The Summit will also feature all of our networking events including the wildly popular Speed Networking, Interactive Roundtables and Games Showcase. There's so much going on, you can't miss it. Here's a short preview of our keynotes and panels.

KEYNOTE PROFILE

DAMIEN BURNS: RAISE YOUR GAME: CONNECTING WITH THE WORLD'S GAMING COMMUNITIES

Facebook's director of gaming for EMEA, Damian Burns will be opening the Future Games Summit this year with a talk that looks towards the future of the games industry. Burns has been involved with the digital industries for over a decade and had ten years of experience at Google before taking on roles at Facebook.

His experience in this ever shifting landscape will undoubtedly make for a fascinating talk, with an incredible panel to follow, with Team17's Debbie Bestwick, Ian Livingstone CBE, Jagex COO Phil Mansell, Ukie CEO Dr Jo Twist OBE and COO of Revolution Noirin Carmody all talking to Games Investor Consulting director, Rick Gibson.

RUSSELL BROWER: GETTING THAT ICONIC SOUND – INSIGHTS INTO CREATING IMMERSIVE AND INTERACTIVE AUDIO EXPERIENCES

Coming all the way from California, Russell Brower is a three-time Emmy award winning composer. His work will be instantly familiar to fans of Blizzard Entertainment's *World of Warcraft*, but he's also worked as musical director on other Blizzard game since, including *Overwatch*, *Starcraft II* and *Hearthstone*.
s
The talk that closes the first day will look at what's next for sound design and music. How do you implement new technologies in to your projects in a cost effective way? What are the secrets to creating unique sounds for different games with different environments? Brower's talk will discuss all this and more.

PANEL HIGHLIGHTS

▸ **AI technology – changing the future of gaming**: Michael Natusch, global head of AI research, Prudential, Mitu Khandaker-Kokor, chief creative officer, Spirit AI, Roberta Lucca, co-founder, chief executive at BOLDR and co-founder, director, Bossa Studios

▸ **An exploration of the impact of streaming on the evolution of game development:** Adam Simmons, VP content and marketing, DingIt.tv, Rob Yescombe, freelance writer & narrative director, Mathew Kemp, senior product owner - Old School RuneScape, Jagex, Rosa Carbo-Mascarell, digital content and social media manager, Creative Industries Federation, Rich Keith, chief revenue officer, Yogscast

▸ **Fast paced and fickle - overcoming barriers to gamer conversion:** Alex Moyet, marketing director, Curve Digital, Chris Bain, marketing director – central and eastern Europe, Xbox, Rob Bartholomew, brand director, Creative Assembly.

▸ **The next generation of narrative storytelling – maximum innovation for maximum ROI:** Rhianna Pratchett, award-winning scriptwriter and story designer, Jonathan Ridgway, chief executive and creative director, Rebourne Studios, James Griffiths, narrative director, Cavalier Game Studios, Thomas Beekers, creative producer, inXile, Will Byles, executive director, Supermassive Games

▸ **VR vs. AR – what's best for your business?:** Sam Watts, director of immersive technologies, Make Real, Jeremy Dalton, co-president, VR/AR Association, Nikki Lannen, founder and chief executive, Warducks, Tanya Laird, founder and chief executive, Digital Jam, Demid Tishin, chief executive officer, Funbakers

▸ **Talent development & retention - from indies to majors:** Benjamin Royce, senior recruiter, Ubisoft, Ian Goodall, managing director, Aardvark Swift, Gina Jackson, head of games, Imaginarium, Simon Iwaniszak, managing director, Red Kite Games

develop
Live Game Jam

The Future Games Summit is home to the first ever Develop Live Game Jam. Teams of two-eight people will all create a game on the theme 'Man vs. Nature'. The jam will be running across both days of the Future Games Summit, starting on October 31st between 8:00am-8:30pm and on November 1st between 8:00am and 2:00pm, with the winner announced later that day.

You don't need to have a team to enter! If you want to enter on your own, you can and you'll be placed with a team.

If you'd like to enter, please email **htovey@nbmedia.com.**
Entrants are decided on a first come, first served basis.
If you're interested in sponsoring the Develop Live Game Jam, please contact **sjaques@nbmedia.com**

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UNCHARTED: THE LOST LEGACY

John Broomhall talks with Naughty Dog's audio lead Phil Kovats

Uncharted: The Lost Legacy continues Naughty Dog's tradition of cinematic storytelling through gameplay consisting of combat, puzzle-solving and large set-piece adventures. Originally a DLC project, it somewhat unexpectedly took on a full life, resulting in some time pressures, but also a super-keen focus. Phil Kovats: "We decided our fundamental approach was no new significant audio systems/features, just necessary evolutions - building on existing successes so we could achieve the right level of polish.

"We deployed a dozen or so staff and contractors plus an outsourcer, Formosa Interactive, identifying recording requirements and specific game tech needs early, scheduling them with just enough time to iterate. With time tight, good communication and collaboration between departments and production staff were vital."

The team's desire to differentiate *Legacy*'s sound from *U4* prompted some quality field recording time, capturing material crucial in defining the game's voice.

Kovats: "*Legacy* is FILLED with rocks and moving water so we zoomed into recording these more mundane sounds, seeking greater variety and nuance. There are over 500 unique waterfall sound IDs alone. In the temple Shiva area, there's more RAM for waterfalls than the whole shipping budget of *The Last of Us*! Meanwhile, the Western Ghats area involves numerous rocks of all sizes. Making them sound unique and size-relative was a huge task. We also recorded a real UAZ 4x4 for exploration areas. Btw the train sounds in the final level are a nod back to those in *U2: Among Thieves*!"

Kovats' team used storytelling audio throughout to deeply immerse players in the experience. For instance, the elephant scene when entering Shiva – a mysterious set-up and sense of possible danger – ambience and treated elephant sounds creating unease. Later when you encounter the trapped female elephant, sounds are adjusted to induce feelings of distress and fear FOR the animal. The ride is serene, trust is gained, so when the female reunites with her herd and young, the elephantine soundscape becomes joyous and euphoric. Kovats: "We wanted the player emotionally connected.

"And we discovered Indian elephants have a wide vocal range! A happy recording accident was an elephant grabbing a lav mic with it's trunk, neatly removing it from the tether and crunching it to death (laughs). When you give the elephant fruit during the ride, that's the sound you hear!"

As you traverse India in *Legacy*, the world, a 'character' itself, breathes.

"There's a lot of real-time DSP. Each sound asset (voice) has 4 local eq filters and distortion settings. Reverbs are multichannel convolutions - up to 18 concurrently realtime, really aiding blending of natural environments. Plus we have real-time IRs for our gun tails and in-line real-time compression and limiting on the mix buss to respond to players' chosen output formats and dynamic range settings."

The mix approach is 'do it as you add a sound' meaning, at the final stages, the mix has iteratively become approximately 85% complete throughout development: "At that point we're adding detailed snapshots, fine tuning bias mixes, hitting details in the environments and reverb mixes. The overall mix is basically there.

"Doing large projects in a short timescale is tough but if the team stays focused and collaborates well, you can accomplish a highly detailed level of work. I'm proud of how our great sound team co-operated to create a unique voice, showcasing individuals' talents while working together towards a clear vision. We're fortunate to get to tell these stories with the latitude we're given – it's an honor." ■

John Broomhall is a game audio specialist creating and directing music, sound and dialogue
www.johnbroomhall.co.uk

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TIGA

VIRTUAL REALITY: ONE YEAR ON

It's been a year since the PlayStation VR took virtual reality to the mainstream and Ssince sales of PC and mobile VR really began to grow. **Sean Cleaver** speaks to studio heads and recruitment specialists to find out what their thoughts are on the virtual reality job market one year on

Virtual reality is nothing new and when you look at the requirements to develop for the medium, very little changes between VR and normal development. However, in the last year the games industry has earned something that it didn't have previously when it comes to VR development – experience.

Things can change once we better know what we're doing. That's no different to developers who are recruiting. One year can make a whole lot of difference. "We have many more developers with VR experience under their belt, which makes it a richer field of play," says Brynley Gibson, head of studio for South London based work-for-hire studio Kuju. "However, I would argue there are still more roles open than there are people with that experience."

"Over the past 12 months we've witnessed a much higher demand across the board for hires into VR projects," says Stig Strand of recruitment specialist Amiqus.

"This time last year we only had a handful of vacancies, but today a good portion of our clientbase has a need for skills in VR, from start-up phase right through to mature businesses delivering large-scale VR experiences."

"Team sizes are much smaller for VR, AR and MR so we tend now to look for developers with a multi faceted skill set," says Stu Godfrey, recruitment manager for Climax Studios. "For example, we look at artists with some visual effects skills and a good technical background."

"The VR industry is growing steadily," believes Aardvard Swift managing director, Ian Goodall.

"Right now, the vast majority of studios developing games for VR are small indies, but there are a small handful of bigger studios who have thrown their hat into the ring. nDreams and Force Field VR have emerged and are recruiting sizable teams. In terms of changing needs however, the industry is still young and experimental, and we haven't seen much change on the recruitment side."

DOUBLING DOWN ON SKILLS

A year on from the release of the PSVR and a good two years since Oculus Rift and HTC Vive became the PC benchmarks for VR, the industry definitely has a better idea of the skills needed in order to develop for virtual reality. For the most part, it's C++ that's the most in demand skill.

"C++ appears to be the most desirable language soughtt after by VR studios, with C# also rather common," says Goodall. "More often than not, studios will be looking for developers with Unreal Engine experience, but we do also see a number of Unity-based roles for VR."

"Most of the traditional skillsets are still applicable to VR," says Climax's

(L-R) Stig Strand, Brynley Gibson, Ian Goodall, Stu Godfrey

Stu Godfrey. "We use the same game engines, but it requires us to do things in a slightly different way sometimes. A great skill to have for VR is the willingness to adapt to new challenges. We now have to look at developers with a multi faceted skillset but as it's such a new and exciting format, it is a much easier draw for talent."

"Demand for C++ and C# coding plus Physical Based Rendering on the art side is strong," says Amiqus' Stig Strand. "For VR especially we see a lot of hirers needing game engine knowledge – UE4 in particular. It's not that VR needs a whole new skillset, but hirers want VR experience now that it's become more established, and they need people to hit the ground running quicker."

Regardless of required coding knowledge, it's still that all important experience that is most in demand. "Experience is what employers need, rather than any specific skills," says Kuju's Brynley Gibson. "However from a creative point of view, as VR does destroy some rules, it is good to have open-minded developers who are willing to try things out."

FEELING THE BUZZ

Any new technology will always cause a creative stir among developers. The excitement of what could be achieved normally powers through into a finished product. As such, studios need to adapt and change in order to focus on the new medium, especially when there are multiple development options to take like MR and AR.

"There is always a good buzz around new technology such as VR, AR and MR and people are always excited to be involved in the bleeding edge of technology," says Stu Godfrey. "Team sizes are smaller and processes differ, but as always it is a case of adaption."

> **We're still waiting for that 'system selling' game for VR but ports will give early adopters enough quality content**
> *Ian Goodall, managing director, Aardvark Swift*

"We are still seeing some businesses focusing on immersive tech, whilst others are just experimenting and keeping it a lean investment," says Brynley Gibson. "I don't think we have seen any radical shifts but are likely to see some bigger titles come to market late next year – the 'generation two' games."

"Output wise, studios are diversifying their output to keep themselves funded until VR games becomes more profitable," says Ian Goodall. "There are plenty of other industries that are experimenting with VR. These are prime clients for these studios to outsource their skills to. "

"We've mainly been asked to focus on VR," says Stig Strand. "but it's the same skills foundation even though the considerations are different for each. These specialisms could develop over time as the market matures."

EXPECT THE UNEXPECTED

New mediums always bring new challenges, but just like any creative endeavour, there's always room to be surprised. So looking back, how did the industry expect the job market to react to the new technology?

"From a hiring perspective I think the demand was expected," says Stig Strand. "It's been steady, I think a possible surprise is that it's not been a crazy rush but it feels like a very solid base with some tremendously exciting projects underway."

"VR is a surprisingly physically demanding technology to use and to play with," admits Stu Godfrey. "We've had to do a lot of work to fight against motion sickness and we've had to ensure a play session doesn't tire people out. Vigorously waving your arms for long periods of time is exhausting! Also, traditional user interfaces and heads up displays don't work, as there is no flat screen to put them on."

"News has massively calmed around VR," warns Brynley Gibson. "Some people worry this is part of a general cooling off around the technology, and that without the 'hype train' it won't succeed. But I see this as a positive thing. Now we can get on with building a sustaining industry around this medium. Seeing Oculus Story Studio close and Altspace struggle is a worry that investment may be being pulled out too early though."

It's a sentiment that Ian Goodall also shares. "Many people seemed disappointed with the uptake of VR hardware and software," he says. "We shone a spotlight on this technology and put it on a pedestal while it was still teething. The result was that the public vastly overrated the impact this technology would have the moment it hit the shelves.

"We work in an industry where a game will be in production for a number of years, yet makes the vast majority of its money in the first few weeks and months post-launch. People placed the same expectations on VR and were disappointed by the result. VR is certainly more of a long-term investment, which relies on enticing more and more adopters of the technology at this stage."

THE LONG GAME

Amidst the worry that investment might be pulled from the medium too early, the skills and experience gained from VR development will benefit anyone working in any game design roles. But VR is still here and the

everyone is just as excited to see what the second generation of the technology will bring. So where will we be in another year's time and what do our interviewees expect to see?

"Steady growth in sales especially on the mobile platforms," Brynley Gibson hopes. "Better games and experiences with some truly unique genres emerging from the medium."

"The hardware devs will be planning on major console-shifting titles in the run up to Christmas," predicts Stig Strand. "After this we expect Sony may release version two of PSVR and other console manufacturers will surely follow suit.

"Provided the sales go as anticipated, this time next year we can expect to see increasingly more ambitious projects and a continued demand for the skills & experience relevant to VR."

The commercial success Brynley Gibson wants and the next generation of technology Stig Strand expects will have to be content driven for gaming to take that charge. That could be in the form of a stand out title or experience driven content like interactive movies. But for now, it may be showing off what we already know in a new light.

"Triple-A studios are still testing the water with VR," believes Ian Goodall. "We've already seen announcements of VR ports of successful games including *Skyrim* and *Fallout 4*.

"I wouldn't be surprised at all to learn of more successful titles retrofitted with the technology. It's a safe introduction for these guys, and honestly, it's a pretty smart move. We're still waiting for that 'system selling' game for VR, but in the meantime, these ports will give early adopters enough quality content to sink their teeth into."

One of the biggest discussions around virtual reality at present is the demand for the technology away from gaming and game development.

"There's also massive interest in VR outside of games. We're seeing it being trialled in everything from sales to medicine, the arts and training. There is no doubt that we'll see this continue into next year. With everything VR, everyone's still trying to figure out what works and what doesn't work. While we'll undoubtedly find out that VR doesn't quite fit into some industries, for others it'll take off in a massive way and become an integral piece of technology going forward." ■

MOVERS AND SHAKERS

The latest high-profile hires and promotions

BOSSA STUDIOS

Former Valve writer Chet Faliszek has joined Bossa Studios to work on a new action co-op game for PC. The hire follows a recent $10 million investment round for the London-based developer, who will be opening an office in Seattle for Faliszek and his team.

Faliszek is mostly known for his work at Valve. While in recent years he was a VR ambassador for the firm, he was one of the creative minds behind both the *Portal* and *Left 4 Dead* series, as well as work on the *Half Life 2* episodes.

TELLTALE GAMES

Telltale Games has announced former Zynga senior vice president Peter Hawley has joined the company as its new CEO. Hawley follows Dan Connors, one of the co-founders of the studio behind *The Walking Dead*, and *Tales From The Borderlands* interactive drama games. Connors will now be taking an advisory role.

MICROSOFT

Phil Spencer has been promoted to executive vice president of gaming, reporting directly to CEO Satya Nadella. The Microsoft senior leadership team has undergone a restructure under thr new CEO. Spencer will still be carrying out his duties as head of Xbox and Microsoft Studios, which he assumed control of in 2014.

NAUGHTY DOG

Game director Bruce Straley has decided to leave developer Naughty Dog after 18 years with the company. Straley, who started as an artist on *Crash Team Racing*, is most known for his work on the *Uncharted* series, including recent release *Uncharted 4: A Thief's End*, and *The Last of Us*.

GET THAT JOB

This month: Code manager at nDreams, **Triston Attridge** talks about getting a job coding for the virtual reality studio

What is your job role?
My role is code manager at nDreams. I manage the team of coders for the developer but I also remain hands on too, using my experience in virtual reality.

What qualifications and/or experience do you need?
At a base level, you need to demonstrate that you're aware of the practicalities of coding within game development. This is preferably experience within the industry on a known title. If you haven't had that experience then you need enough portfolio work to show that you've been through a similar process.

If you were interviewing someone, what do you look for?
Generally, I'm looking for self-motivated people who are team players, but the specifics of the role is important too. For graphics coders, they'd need to demonstrate experience with different rendering application programming interfaces (APIs), and understand how graphics processing units (GPUs) work. We're hiring for a graphics coder right now.

(If you want to know more about nDreams, its studio culture and available perks, you can read all about the studio on the next page in our Recruiter Hot Seat.)

What opportunities are there for career progression?
The most obvious is adding more skills to your repertoire as you tackle an ever-changing wide variety of problems. There's also moving up to manage either complicated systems or other people. ■

> **I'm looking for self-motivated people who are team players, but the specifics of a role is important too**
>
> *Triston Attridge, code manager, nDreams*

SKILLS AND TRAINING

This month: Sean Cleaver looks at the various engine tutorials and educational courses available for VR development

Websites:
Unity: unity3d.com
Unreal: unrealengine.com
CryEngine: cryengine.com
Staffordshire Univeristy: staffs.ac.uk
University of Bath: bath.ac.uk
Udemy: www.udemy.com

One thing that is very clear when it comes to VR development is that the required skill sets are not that different from normal game development. Most of the required coding skills are based in C# or C++. However it is experience that is needed in order to best utilise those skills.

Training, of course, depends on your game engine and the tools available to you. One of the most robust virtual reality development engines, certainly with the amount of platforms you can export to, is Unity.

Tutorials on Unity's website are very good at introducing people to VR development at a beginner or intermediate level. Searching the website, there is a great 'Introduction to VR' course which will help you grasp the basics of movement and UI for VR. There are also live training sessions, which will show you how to use essential VR features such as 360 video and creating an avatar for a player. Unity runs these live training sessions regularly on various VR development related subjects.

Unreal Engine has one of the most powerful VR toolsets and with UE4's training documents hub, you'll find instructions to get the best out of specific headsets. This is includes mobile headsets like Samsung Gear VR, Daydream as well as Steam VR.

Much like Unity, Unreal also runs live streams and training videos for VR development, including how to use the Unreal Blueprint feature and motion control tutorials. CryEngine is another VR engine with a large database of tutorials and help. With these engines, available for free, it's easier than ever to jump in and experiment.

EDUCATIONAL COURSES

Universities in the UK are quickly adding VR development to their computer game design courses, One of those universities is Staffordshire University in Stoke-on-Trent, who recently added a full course with a focus on VR development in its second year curriculum.

Motion capture is another big area of VR development and the University of Bath has one of the best setups in the country. Opened last year, the £5 million studio had the backing of the The Imaginarium and VFX specialists The Foundry. Courses that involve motion capture will also give any student a transferrable skill set to animation in visual effects.

There are also many premium courses online by lecturers from sites such as Udemy. Make sure you do your research before you take up a course with any financial cost. ■

RECRUITER **HOT SEAT: NDREAMS**

Tamsin O'Luanaigh, talent director at developer nDreams gives us a look in to the VR studio and the perks on offer, including 'Bacon Mondays' and 'Beer Fridays' – that sounds nice to us!

CURRENTLY HIRING
Company: nDreams
Location: Farnborough, UK
Currently hiring: Artists, programmers and designers
Where to apply: http://www.ndreams.com/company-info/jobs

What differentiates your studio from other developers?
nDreams is focused on virtual reality and has been since 2013. We're looking to make innovative, commercial VR titles and we have a major focus on early prototyping and encouraging ideas from anywhere in the company. We pride ourselves on not hiring people who are political (we like everyone to be honest and open) and believe we've built a studio where people work together rather than being siloed into independent departments and also have a healthy work/life balance.

What perks are available to working at your studio?
nDreams have competitive salaries and a good pension scheme, childcare vouchers and season ticket loans. We try and accommodate work/life balance as much as possible so the team works core hours 10:00-5:00. In addition to holiday, we offer two duvet days and you get your birthday off. We also provide a free counselling service for all staff. In the studio, there is always access to free fruit and there is a subsidised tuck shop, along with 'Bacon Mondays' (once a month) and 'Beer Fridays' (also once a month).

We try and arrange occasional bowling/cinema trips and we always have a summer and Christmas party. We support Video Games Ambassador membership (VGAs) and allow time off for events. We subsidise membership of BAFTA Crew for any of our staff who wish to apply.

What should aspiring devs do with their CV to get an interview?
Your CV needs to stand out and show your passion for your skills and the job we are hiring for.

Your portfolio needs to be up to date. Don't fill it with everything you have ever done, make sure the quality stands out. Make it easy for us to see who you are.

What advice would you give for a successful interview at your studio?
If you are having an interview, then we have already seen your potential in your CV. Now we are looking at how you might fit in with our team? What potential do you have for the future? Can you fill existing gaps? How passionate are you about VR or your technical area? How do you resolve problems? Just be honest and show us who you really are.

Who is the best interviewee you have ever had and how did they impress you?
The best interviewees are those who are truly honest about their capabilities and don't try and be something they aren't. In VR we are all learning new skills and facing new tech and challenges. We want people who can work with our teams and find solutions together. We have taken a lot of people on this year and they have been people who have been impressed us in different ways – everyone has their own strengths and unique area of talent.

And who was the worst?
Fortunately, our selection process is pretty good so it is rare for us to have really poor interview experiences. Occasionally we find that candidate expectation is different to our own but we make every effort to ask challenging questions early on in the process so that no one experiences any wasted time.

> **Just be honest and show us who you really are**
> *Tamsin O'Luanaigh, talent director, nDreams*

If you have recruited internationally what is the process like?
We have a lot of European staff working in our studio. The recruitment process itself within nDreams is quite established and is similar wherever the applicants come from. We have helped a few staff relocate here and as with anyone moving to the area, our HR department helps with the transition.

How have recruitment needs changed at your studio?
Recruitment has evolved hugely in the studio in the last couple of years. We have transitioned from taking on staff referrals or phoning up an agency two or three times a year, to setting up a formalised in-house multi-sourcing recruitment strategy. We combine agency sourcing, staff referrals and direct advertising for permanent, freelance and contract roles.

It really depends on the project we are working on and the type of roles and skills we might need at any given time. We take great pride in building a core team of talented development staff. The types of roles we hire for tend to be predominantly development – art, code, design, production, QA – and they are determined by the projects and lifecycles at any given time. ■

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ASK AMIQUS

Liz Prince, business manager at recruitment specialist Amiqus, helps solve some of the trickier problems job seekers currently face in the games industry

Q What special skills do employers look for when hiring for roles on VR projects and how risky is it for workers to skill up in those areas considering the longevity of VR is still unknown?

Last year VR was included in UKIE's Consumer Spend Report for the first time, with a valuation of 61.3m and so far VR seems to be making a great commercial start. VR projects have been rising steadily during 2017 and we have seen the demand in VR skills follow this upward trend.

On the surface of it, new skills do not appear necessary, core VR code-base is built on the most in-demand areas such as C+, C# and Unity. Art assets and environments created using Physics Based Rendering are also not unique to VR, but we are now seeing demand for candidates who have gained VR experience, either through employment or at University. Employers are starting to look for the context of deployment rather than skills alone – so effectively VR itself is becoming a skill. It's early days and many specialist abilities needed to address the unique challenges of VR are still in formation. So what are employers looking for when hiring for VR projects today?

PROBLEM SOLVING

A key ingredient is problem solving skills. Candidates with a leaning toward methodical, mathematical or experimental thought processes are of great interest to studios facing new challenges. The enhanced physicality of the gameplay interaction and multitude of visual configurations makes rendering images without blurring a major challenge. Achieving sufficient speed for a seamless VR experience increases demand both from an artistic and a technical perspective and optimising the efficiency of the code base is of critical importance. These features point to an evolving trend that the disciplines of creative and tech are growing closer together when it comes to VR.

This new level of granularity in the interdependence of image and code has lead to employers demanding stronger visual evidence in portfolios when hiring. Programming jobseekers can typically evidence their skills by showing source code excerpts, however when it comes to VR, studios want to see the impact of the code on the in-game visuals. On the art side, managers not only want to see the right quality models and artwork but how artists have technically integrated their assets into the game engine. Portfolios need to be comprehensive enough to demonstrate these fully rounded skills, showing an understanding of how they will cope with the additional demands of VR.

> **There is an entrepreneurial spirit in the space with many industry vets channelling their experience into setting up new VR ventures**

SENSE SHIFTING

As a game experience becomes more immersive, so the role of the senses shifts from the everyday. The VR headset reframes vision and removes real world touch so that the compensatory instincts kick in, particularly hearing. This means that audio, which has always played a key role in games, has an even deeper level of contribution to make to the VR experience. We have seen an increase in the demand for audio programmers in particular. Now that a player can turn toward or away from the source of a sound, the impact of even the smallest nuance in ambient sound will play a major role in sustaining the level of immersion. Once again a solid portfolio and showreel should demonstrate the level of detail and finesse VR requires and hirers seek standards above the ordinary.

Another focus area is UI skills. The traditional thumb oriented handset is not available in VR and while this rewrites the design rulebook on menu access and selections, user interaction requires a higher level of intuitiveness to avoid confusion. Getting lost in virtual menus or physically knocking things over in reality is a no no. Gameplay interactions have a new dimension of consequence – in fact pretty much every consideration in a '2D' game is amplified exponentially in VR. To a large extent the level of specialism a hirer is looking for depends on the size of the studio and what scope of project they're working on. Some are looking for knowledge of a specific headset, others are happy with art or coding generalists, and some need the aforementioned tech-creative hybrid to bridge the two.

DURABILITY OF VR

One of the threats to growth that have been levelled at VR is that the level of immersion could potentially cut-out any interactions beyond the headset, making the VR experience an engaging but lonely pursuit. This has already been countered by the likes of vTime, developer of a VR social network that allows anyone, anywhere to spend quality time with family and friends in virtual reality. For vTime, VR has social connection at the core, aiming for participants to enhance people's experiences of their relationships.

In 2017 the market has seen a continued rise in demand for VR skills both in and outside of games. This is reflected in the growth in VR titles being brought to market, but it's worth noting that this has been a steady stream of releases rather than an explosion. Whatever the reason, if there is no 'bubble' to burst and market confidence grows gradually, the outlook from the commercial bedrock of VR looks strong. There is an entrepreneurial spirit in the space with many industry veterans channelling their experience into setting up new VR ventures. Despite the inevitable naysayers it remains an exciting, innovative space for a career in games. ■

Liz Prince, business manager at recruitment specialist Amiqus, helps solve some of the trickier problems job seekers currently face in the games industry

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HIGH-END AUGMENTED REALITY AND VIRTUAL REALITY **IS WITHIN REACH**

Epic Games continues to push the leading edge of augmented and virtual reality platforms

THE EVOLUTION OF VIRTUAL REALITY

At the recent Oculus Connect 4 in San Jose, Epic Games' Nick Whiting, technical director of AR and VR, presented "The Road to Release: A Technical Postmortem for Robo Recall" to share how Epic achieved high-end visuals at 90fps for its first fully-featured virtual reality game, the first title to break 3,000 ratings on the Oculus Store.

Of the many things discussed at the presentation, attendees were able to get an understanding of the threading model used and how the team approached optimisations to the game, render and audio threads.

When it comes to the technology behind *Robo Recall*, the audience at Oculus Connect 4 were shown the best practices for using Unreal Engine 4's profiling tools for tracking down inefficiencies. Whiting also looked at the numerous game-side optimisations that were made to maintain 90fps throughout the popular virutal reality game.

There was an overview of the many new UE4 features built for *Robo Recall* such as the new forward renderer with multisampled antialiasing (MSAA) and multiple lighting environments, and the whats, whys and hows of adding modding capabilities to *Robo Recall*.

Potential UE4 developers also saw how to approach custom scalability for different machine configurations as well as a look at where Epic Games is taking UE4 next.

The full presentation is available at http://epic.gm/oc4 for those interested in the technical deep dive.

AR FOR ALL

With Apple's introduction of the iPhone 8, iPhone 8 Plus and iPhone X, all of which are finely tuned for augmented reality running on iOS 11, a wave of new content built with ARKit is making its way to the App Store.

At the same time, developers are also turning to Google's ARCore to target AR-supported Android devices and to bring their projects to additional platforms. Unreal Engine 4.18 launches this month with native support for ARKit and ARCore, and the early market leaders are already making names for themselves.

To demonstrate AR capabilities of the new iOS devices during the recent Apple special event, Atli Mar Sveinsson, CEO and co-founder of Directive Games, revealed *The Machines*, a multiplayer battle game released alongside iOS 11.

"With *The Machines* we have pushed the boundaries of visual fidelity in augmented reality incredibly far," said Sveinsson. "The power of the new iPhone and Unreal Engine are the perfect combination that allows us to reach that goal. With its rendering tools and the accessibility of many other features, Unreal is set it in a class of its own."

Directive Games created *The Machines* using Unreal Engine 4.17 and pre-release support for the improved Metal 2 shader compiler and native ARKit support. These improvements, plus additional optimisations specifically targeted at iOS 11 and macOS High Sierra, are available to all developers using Unreal Engine 4.18. ■

You can download Unreal Engine 4.18 now by visiting: **http://unrealengine.com**

The develop POST-MORTEM

There has been a Forza branded game released every year since 2012. Three of these have been created by Leamington Spa-based Playground Games, earning acclaim as some of the best racers ever. **Sean Cleaver** speaks to creative director Ralph Fulton to find out the story of Forza Horizon 3

Forza Horizon 2 in 2014 became one of the most respected racing games of this generation and was a massive hit for the Xbox One's exclusive line-up. Developer Playground Games, however, had no time to rest as the next road trip was just around the corner and across the globe.

"We started thinking about *Forza Horizon 3* pretty much as soon as we had shipped *Forza Horizon 2* back in late 2014," says creative director at Playground Games, Ralph Fulton. "We follow broadly the same process on each project, starting with a long list of possible locations which we gradually whittle down as we do deeper research.

"For *Horizon 3* we were looking for a location with really diverse scenery and, as we discovered more about it, Australia really impressed us with just how varied it was. When we reached the final three in our search, Australia was the clear winner."

Forza Horizon 2 set a very high bar for the series with its stunning recreation of the Cote d'Azur and Northern Italy. "We were very proud of it, and we still are, and the work we did on that game gave us a great starting point for the next project," says Fulton. "During the first few months of the project we prototyped some really key new technologies which we felt would take our visuals to the next level. We've talked about the dynamic HDR sky system a lot, but the voxel-based global illumination system was equally important to the look of the game."

SHOWSTOPPERS

The HDR visuals in *Forza Horizon 3* were used as a showcase for the Xbox One S back at E3 2016 but Playground didn't originally develop *Forza Horizon 3* with that in mind. "We have a really special relationship with Xbox through Turn 10 and we get to hear about things a little earlier than everybody else, but we didn't hear about what would become the Xbox One S and its HDR output until we were well into production on *Forza Horizon 3*," admits Fulton.

"HDR is a great example of something which comes along midway through a development cycle and presents an opportunity that you just have to grab. ForzaTech uses a physically-based rendering system, which models light in a physically correct way, so our game was perfectly set up to incorporate the extended brightness gamut enabled by HDR. I think we had the very first Xbox One S devkit in the UK so we could begin investigating the feature, which also necessitated buying a bunch of HDR-ready TVs for use in the studio. Back then they were less common and much more expensive.

"We also found that the way TVs displayed HDR varied greatly from model to model, which added complexity to the process. In the end, our lighting team ended up bearing the brunt of the work, but because they'd had the foresight to capture all our Australian skies in 12K and HDR, we had the assets to really show off the technology."

DRIVING CHOICE

One of the big draws of the *Forza Horizon* series is that it is a veritable treasure chest of motoring fun, from everyday cars to the exotic. But being set in Australia, there are many cars that might not be familiar to the rest

of the world. "There are always a handful of cars on every project which are difficult to get hold of and, as it turned out, some of the Australian domestic cars were the most problematic on *Forza Horizon 3*," says Fulton. "We really wanted Australia to be more than just a backdrop to our game and we decided to celebrate Aussie car culture as much as we could. Their culture of Ford vs Holden, and V8s and Utes isn't immediately familiar to everybody north of the equator, but we did feel it was really interesting and colourful and would add to the game.

"That meant a member of our research team spending a long time trying to track down some of the older cars in Australia, which is not a small place. He was scheduled to be there for a week, but as he was heading for the airport to fly back he got a call about a hard-to-find Holden, which he'd been trying to track down. He cancelled his flight, and ended up staying for a further three weeks!"

EXPANDING AUSTRALIA

Storm Island was an interesting DLC world for *Forza Horizon 2*, tasking players with the great extremes of mother nature. *Forza Horizon 3* was no different with the impressive snowy peak of *Blizzard Mountain*. "We had *Blizzard Mountain* in mind during development of the main game," says Fulton. "Snowy conditions had been something we'd really wanted to do in the series for ages and we were certain our players would enjoy it.

"I love the amount the team packed into it in terms of content and gameplay, but also the little flourishes which you might not even notice. I laughed out loud when I discovered the yeti footprints at the top of the mountain. I always felt that the idea behind the expansion was a bit of a no-brainer, but its success comes from the execution by the team.

"Snow and ice sound like they'd require a big change to our handling, but it's really just an extension of the way we model tyre compounds and tyre treads in our physics simulation, so it's systemic rather than faked. That's why the handling remains identifiably '*Horizon*'. The team did a great job of making these new driving experiences feel new and exciting, though. Reduced visibility, swirling blizzards, snowflakes on the windscreen, the crunchy audio of tyres hitting virgin snow, and the cool way snow deforms around the car all make it feel very different."

By contrast, the *Hot Wheels* expansion wasn't as obvious, as Fulton explains. "The *Hot Wheels* idea was about as far from a no-brainer as you can get! We had a few ideas, but the only one which got us really excited was the completely ridiculous one: that we'd build an enormous, life-size Hot Wheels toy track in the sky off the coast of Australia and race around it.

> **We weren't sure how our players would react to Hot Wheels when we announced it**
>
> *Ralph Fulton, Playground Games*

"The team were really passionate about this idea and put together some fantastic concept imagery, which really sold it to everyone, including Mattel. It's fair to say that we weren't sure how our players would react to it when we announced it.

"Authentic physics is really important to *Forza* but we went into the *Hot Wheels* expansion thinking that we might have to mess around with physics to get cars sticking to the loop-de-loops and huge inverted track pieces which characterise the map. In the end, though, we didn't and the expansion is better for it. Gravity works exactly as it does in the main game, and our car handling designers and level designers worked together to ensure that our tracks had enough centripetal force to keep the car on the track.

"The speed boosts are a nice call-back to the Hot Wheels toy tracks you played as a kid, but they're also vital to ensuring cars are going fast enough to stick in the stunt sections which follow. It definitely makes for a higher average speed than you typically find in *Horizon*, and we had to reconcile ourselves that some lower car classes just wouldn't be able to cope with the jumps, climbs and loops. But I think the pack is better because of this emphasis on the fastest cars in the game, and we didn't have to tamper with the physics system, which is the bedrock of our driving experience."

MEASURING SUCCESS

Ralph Fulton is very proud of *Forza Horizon 3*, as well he should be, but when it comes to the creation of the game, its look and its success, the pride is very much focused on his team at Playground Games.

"The thing I'm most proud of is the way the whole team set about finding ways to improve on every single aspect of their work over the previous title. Whether it was road texturing, or wet weather effects, or user interface, nothing was deemed 'good enough' and the team spent all of pre-production finding ways to make everything better.

"I've heard people say that *Forza Horizon 3* felt like a generational leap over the previous game and that's a credit to the team who refused to say 'that'll do'." ■

GAME FOR A **LAUGH**

Indie developer Byron Atkinson-Jones is going on stage to tell jokes in the name of charity. This month, he gets some advice from fellow games industry member, Claire Sharkey

Last month I said I was appearing on stage for the first time at a club in Angel in London. Well, it didn't happen. No, I didn't run and hide in some small dark corner shivering in fear – something happened at the club which meant they had to cancel and re-schedule the event. I've not had the new date yet, but it does mean I've had a stay of execution for a while. I only got the email telling me this the day before and I couldn't tell if I was relieved or disappointed that the show had to be postponed for a month. There was a certain amount of nervous excitement associated with actually getting up on that stage for the first time and trying to make people laugh. I don't mind admitting my first reaction was "aaaand relax" when the email came through.

Don't' worry, the gig on the 2nd of November still seems to be going ahead and, at this rate, it's in danger of being my first time on stage. It's where Jack Dee and Eddie Izzard started their careers too so there's no pressure at all. It would be interesting if something larger did come out of doing all of this – it certainly can't pay worse than being an indie developer!

The extra time I've got is allowing me to work on my material a bit more. One consistent line that I plan to use in all my routines on stage is:

"Hello, I'm Byron and I'm an indie developer, or as my wife likes to put it: unemployed"

Needs quite a bit of work and probably won't work on non-game developer crowds but it's a starting point for the tone of the rest of the material. Don't worry though, that isn't all my material, as that would be a very short gig! Between now and the gig there will be a lot more.

While I was at Develop conference this year, Tracey McGarrigan introduced me to another person in the games industry, Claire Sharkey, who also did some stand-up comedy. The line of games industry related people who are also stand-up comedians is growing, it's like a dark secret that's finally coming out into the light!

> Don't picture everyone naked. That never works well. Don't appear on the stage naked, that never doesn't end up with arrests

A few of the producers I've had over the years would make a comment like "you're all comedians" when we handed in our task length approximations, and I used to think that it was just a throw away comment but perhaps it was a prediction as I'm finding more and more developers have also done or are doing stand-up comedy. I wonder why that is? I'll bet there's a potential PhD study in there somewhere.

Just like with Imran and Brenda, I asked Claire some questions to help me on my quest to raise some money for GamesAid by doing stand-up:

Who are you and what's your connection to the games industry?
My name is Claire Sharkey and I run Brand and Community at dingit.tv. I've worked in the gaming industry (PR and journalism) for 6 years. At Dingit I'm responsible for Events, Social Media and Sponsorship and helping to further establish Dingit in the eSport, gaming and media sectors.

What's your connection with stand up comedy and how did you end up in it?
Well my life is a joke, so I thought that I may as well make myself useful and see if I could entertain people at the same time, so I've done a couple of stand-up performances, but am no means a pro. My style is basically recounting actual life events, hoping to make people laugh and not succumb to deep depression. The first stand-up I did was in Greenwich at Up-The-Creek, against a tough audience, but I ended up beating (sounds harsh) 15 other acts to win a bottle of cava and an envelope with £20. It was the least dodgy exchange of those two items I'd ever encountered.

So I'm doing this insane 5 minute comedy routine at the Comedy Store next year, any tips on not dying on the night?
Don't picture everyone naked. That never works well. Don't appear on the stage naked, that never doesn't end up with arrests. Just practise to yourself, maybe some friends, but if you are nervous about a big event at a well-known venue like the Comedy Store, doing some practise runs at local open mic venues really does help you gauge your own nerves and how a general audience will react to your deliveries. ■

To donate, please visit:
www.justgiving.com/fundraising/byron-atkinson-jones

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